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كلية الطب والعلوم الصحية
دائرة العلوم السريرية الطبية
دفعة بصمه طبيب 31
طب بشري

OPHTHALMOLOGY



Cataract

Lecture No. **11**

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جروب ((C))

اللجنة العلمية لدفعة بصمة طبيب 31

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Cataract

* **Lens** :- is transparent, biconvex structure of crystalline appearance placed between vitreous and iris.

- Refractive Index : 1.4
- Dioptric power : 18 diopter
- Diameter : 8-10 mm
- Thickness : 4 mm

Weight :

→ **parts of Lens** :- Capsule, Cortex and nucleus

→ **Lens substance** :- it's fibers newly formed. fibers laid outside, the older fibers pushed inward and undergo process of sclerosis to form nucleus so in children there is no nucleus. so treatment of cataract in children done by aspiration.

→ **Functions of Lens** :-

- 1- To provide refractive power to optic system
 - 2- Accommodation for near vision.
 - 3- Absorption of harmful light.
- the eyes can see only lights between infrared and ultraviolet but when eye see lights under infrared or over ultraviolet lead to harmful effect on macula. So advice peoples about harmful effect of direct vision to sun because that contain infrared light.

Disease of Lens

Cataract

↓

The most common and important one.

Dislocation and subluxation

congenital anomalies.

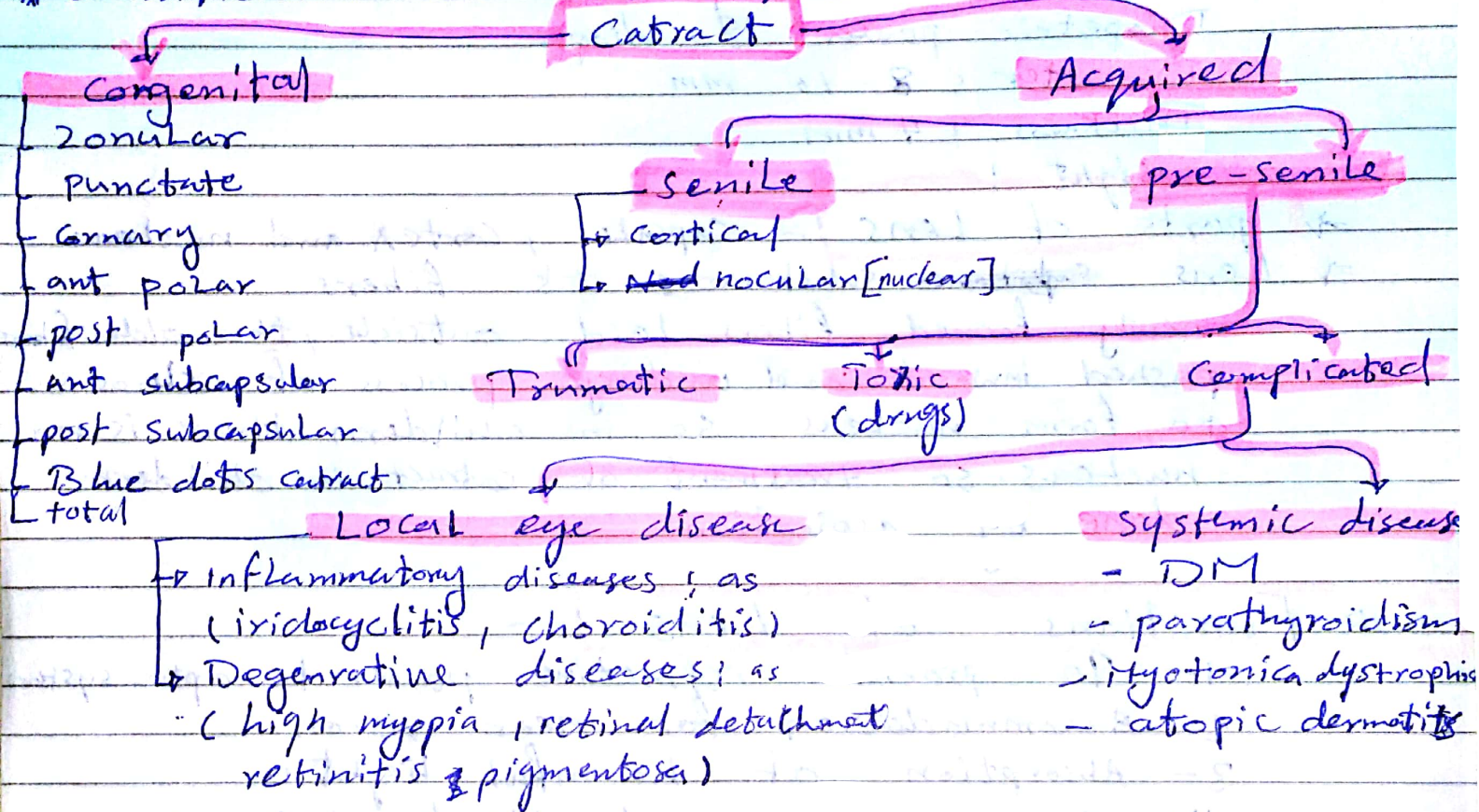
Cataract:-

Date

No.

* Cataract :- is any opacity of lens or it's capsule
 أي عتامة عدسة العين أو غشاها (أي عتامة عدسة العين أو غشاها)

* Classification of cataract :-



* Congenital Cataract *

* Etiology of congenital cataract :-

- 1- hereditary (genetic).
- 2- during pregnancy
 - Maternal malnutrition
 - Maternal infection as TORCH infection
- 3- during delivery :- severe bleeding as in case of placenta previa or obstructed labor
- 3- Deficiency oxygenation.

* Clinical picture of congenital cataract :-

→ Symptoms :-

① Leukokoria (white ^{pupile} pupil) :- it's most important symptom but may be absent in some cases as in posterior subcapsular cataract.

- D.D of Leukokoria :-

- 1- congenital cataract (most common cause)
- 2- Retinoblastoma (most dangerous cause)
- 3- Toxocariasis
- 4- Coat's disease
- 5- retinopathy of prematurity.
- 6- cystic membrane.
- 7- congenital corneal opacity.
- 8- retinal astrocytoma
- 9- incontinentia pigmenti
- 10- Toxoplasmosis
- 11- medulloepithelioma
- 12- total retinal detachment.
- 13- endo / panophthalmitis.
- 14- persistent hyperplastic primary vitreous (PHPV)



② Marked visual impairment.

③ nystagmus.

④ Squint.

→ Signs :-

- ① white reflex
- ② Black opacity against red reflex.
- ③ systemic congenital anomalies may be seen.

* Treatments of Congenital cataract :-

- ① No treatment :- if the visual field not affected as in blue dots cataract.
- ② Mydriasis :- as in anterior polar (central) cataract.
- ③ Surgical :- by irrigation and aspiration operation or needling operation.



but implantation of intraocular lens is controversial between doctors. Some of them do implantation before 2 years of life and others against due to change in pigments of lens by increase of age and due to increase of tissue proliferation in children. So implantation of lens lead to fibrosis. So do operation after 10 years.

Note if congenital cataract impire visual field and not treat in proper time may lead to amblyopia.

* Acquired Cataract *

* Senile Cortical Cataract *

it is most common type of senile cataract

* Etiology :- it is due to degeneration of the lens fibers either due to

1- Hydration

2- Denaturation and coagulation of lens proteins

* incidence :- > 50 years

both sexes affected equally.
usually bilateral.

(5)

* Clinical Stages of Senile cataract :-

- 1- Immature :
 - Lamellar separation
 - Incipient
 - Intumescent
- 2- Mature cataract
- 3- Hypermature and Morgagnian cataract.

* Immature Cataract :-

- 1- There is demeritation of Lens fibers
 - in incipient stage lens swollen and may lead to phacomorphic glaucoma (secondary closed angle glaucoma)
 - 2- Gray appearance of the pupil.
 - 3- Unilateral polypia
 - 4- visual acuity is impaired ($\frac{6}{18}$ - $\frac{4}{90}$)
 - 5- Coloured halos
- ↳ DD :-
- ① immature cataract
 - ② Mucoperulent conjunctivitis
 - ③ postdental stage of congestive glaucoma.
- ↳ red reflex is black spots against red background

* treatment of immature cataract depend on needs of patient

مع الحاجة الى رؤية واضحة كالمريض الذي يحتاج الى قيادة السيارة او العمل في مهنة تتطلب رؤية جيدة
الطبيب والقياسين يراجعون الحالة الشخاطة التي اذا كان جزء بسيط من النقرة
في العينين فلا يزالون.

* mature cataract :-

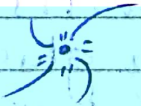
- 1- entire cortex is opaque
 - 2- iris shadow test is negative
- Lens is transpiration (العدسة الشفافة) → mature → Negative (سلبية) slightly positive (موجبة قليلاً)
- 3- Red Reflex is negative
- 4 visual acuity severely deteriorated may reach to blindness.

* Hypermature cataract

Date

No.

- 1- Cortex become fluid.
- 2- Nucleus becomes small sinks by gravity in the bag of liquified cortex and called morgagnian cataract
- 3- anterior capsule thick, wrinkled.
- 4- iridodonesis (عوارض زجاجي)
↳ DD: ① Hypermature cataract
② aphakia.
- 5- Deep AIC
- 6- subluxation, dislocation.
- 7- phacolytic glaucoma :- due to hypermature cataract lead to weakness of capsule and formation of holes in capsule and leakage of lens protein with particulates in anterior angle lead to phacolytic glaucoma (secondary open angle glaucoma).



* Senile nuclear cataract *



There is sclerosis of the central nuclear fibers, the cortical fibers remains transparent.

Incidence :-

> 40

* Clinical stages :-

- 1- Black cataract (Cataract nigra).
- 2- The cloudiness spread to cortex.
- 3- Mature; all lens become nucleus, progressive myopia (second sight) عوارض زجاجي
- 4- Hypermature not occur as process very slow.

* Clinical picture :-

→ Symptoms: ① visual impairment due to progressive myopia
② central opacity.

→ Signs: ① blackened pupillary reflex
② hazy media.

* Complicated Cataract *

- it's occurs as result of systemic diseases or local eye disease.
- Note: the relationship between cataract and atopic dermatitis is by embryonic origin of skin and lens from surface ectoderm.

* Other causes of acquired cataract *

(A) Traumatic Cataract

Called Rosette cataract due to direct trauma on lens.

(B) Toxic Cataract :-> drugs induce cataract

Cataract induced by drugs: 1- Steroid (drop/systemic) 2- Chlorpromazine

التهاب العين
الزجاجي

- | | |
|---------------|-------------------|
| 3- amiodarone | 4- phenothiazine |
| 5- busulfan | 6- naphthalene |
| 7- ergot | 8- Lactose |
| 9- thallium | 10- dinitrophenol |

* Clinical picture of acquired cataract *

* Symptoms :-> Early :

- (1) Black spots in front of the eye (muscae volitantes)

(2) unocular diplopia,

(3) Coloured halos.

Late :

(1) peripheral opacity.

(2) central opacity.

(3) progressive myopia.

(4) Last there is severe affection of visual acuity may reach to PL (perception of light).

* Signs :-

- 1- white pupillary reflex (Leukocoria)
- 2- Change in red reflex
 - ↳ Negative in mature cataract.
 - ↳ black spots against red background in immature cataract.
- 3- Refractive errors, as Myopia in nuclear cataract.

* pre-operative preparation *

General conditions & eye conditions should be assessed before operation.

* Examination and assessment of eye :-

- ① pupillary reactions :- ex if pupile fixed dilated don't do operation
 - ② visual acuity.
 - ③ intra ocular pressure :- if it increase operation may lead to optic cupping.
 - ④ Lacrimal apparatus examination if there is any lacrimal disease must be treated before cataract because operation may lead to endophthalmitis.
 - ⑤ Fundus examination if can't done by Fundoscopy asses Fundus by other method as optic nerve function test and ultrasounds to detect any retinal disease as tumor.
- Note Most common tumor in children is Retinoblastoma.
Most common tumor in old age is choroid melanoma.

* Examination and assessment of general condition :-

- DM
- HPR
- CVS
- gross septic foci

* indications for cataract surgery *

① visual improvement

② medical causes :-

phacolytic glaucoma
phacomorphic glaucoma
Retinal disease

من الضروري من علاج cataract لكي يتحسن البصر
من أمراض العين Retina و cataract

③ Cosmetic causes.

* Treatment of Acquired cataract *

- There is no medical treatment

- Surgical treatment :-

① Cautshing (القش)

طريقة قديمة كان يستخدمها قدماء الفراعنة وإحدى كانت تقام في العين في الوقت قريب
وقد استمر هذا البناء منقبة مناه في محافظة قنا

حيث كان يستخدم من الذهب ويتم إدخاله في pars plana لكي يزيل
العدسة التي Vetrus فيمنع النقر قبل أن يترواح على الشبكية

② ICCE (Intracapsular cataract extraction) :-

يتم استئصال lens بكل مكوناته capsule, cortex, nucleus
وإن هناك من complications حادة من Exfoliation hemorrhage
أي أن العين تتفجر خارج كل مكوناته من anterior chamber إلى posterior chamber
وإن ذلك يؤدي إلى الالتهاب من التهابات العين
corneal opacity, glaucoma.

فذلك قد يتم استئصاله من العين

③ ECCE (Extracapsular cataract extraction) :-

يتم إزالة cataract من posterior capsule و يخرج vetrus
وإن ذلك يتم من المريضة بالعاملين أو بشكل بسيط لا يدخل في العين
فذلك قد يتم استئصاله من العين

④ ECCE + iol (Intra ocular Lens implantation) :-

posterior
Anterior :- implanted lens is fixed over iris lead to
Urbt syndrome
Le uveitis & glaucoma & hyphema.
int is fixed
implanted lens
over posterior
capsul

1. Dislocation of Lens

No.

- * **Subluxation** :- displacement of lens inside its place due to partial rupture of zonule.
- * **Dislocation** :- displacement of lens outside of its place due to complete rupture of zonule into anterior, posterior, subconjunctival, outside the eye.

* **Etiology of eye displacement** :-

- ① Traumatic dislocation.
- ② Systemic association with subluxation in
 - 1- Marfan syndrome (upward subluxation)
 - 2- homocystinuria
 - 3- Marfan syndrome.

Congenital anomalies

- ① **Coloboma of Lens** :- Coloboma means partial defect in lens or eyelids or iris or choroid or optic nerve.
always be inferior due to embryological close of optic cup occur in inferior aspect.
- ② **Ectopia lentis** :- occurs in periphery of lens either upper or lower or lateral or medial.
- ③ **Lenticonus** :- as **Corniculus** - conical projection of anterior or posterior wall of lens as in alport syndrome.

Note :- alport syndrome is inherited

disease include

- 1- Kidney (nephrotic syndrome)
- 2- deafness
- 3- anterior Lenticonus

قد لا يتواجد في كل الحالات
alport في

~~Thet~~